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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,020	02/03/2004	Bangalore A. Nagaraj	122779	2019

30952 7590 09/06/2006

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EXAMINER
AUSTIN, AARON

ART UNIT	PAPER NUMBER
1775	

DATE MAILED: 09/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/708,020	NAGARAJ ET AL.	
	Examiner	Art Unit	
	Aaron S. Austin	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "an amount sufficient to" in claim 1, line 17 and claim 17, line 19 is a relative term which renders the claim indefinite. The term " an amount sufficient to " is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darolia et al (US 6,887,595) in view of Wisander et al (US 4,377,371).

Darolia teaches a thermal barrier coating for a metal substrate comprising a first layer of zirconia stabilized with up to 10 wt% stabilizer, and a second layer of zirconia stabilized with 10-30 wt% stabilizer. The second layer is provided with a thickness greater than the first layer. A bond coating and an alumina layer are present between the substrate and the first and second coatings of zirconia. Regarding the phases of the zirconia layers, the amounts of stabilizers added to the zirconia layers overlaps with that of the instant claims. Specifically, the first layer is preferably stabilized with about 5-8 wt% stabilizer, and the second layer is 10-30 wt%. As these ranges clearly overlap with the instant claims, the stabilization is expected to be similar, resulting in similar phases.

Darolia does not specifically teach the presence of microcracks in the second zirconia layer.

Wisander et al teach a thermal barrier coating for a turbine engine component substrate, the coating comprising second zirconia layers. Vertical microcracks are generated in the coating by scanning a laser beam over the plasma-sprayed ceramic surface (column 2, lines 11-12). These cracks provide resistance against formation and growth of catastrophic cracks during exposure to thermal shock as well as improved erosion resistance for the thermal barrier coating. It would have been obvious to one of ordinary skill in the at the time of the invention to provide the thermal barrier coating of Darolia with microcracks like those taught by Wisander et al., as it is clearly taught that the microcracks provide the benefit of improved resistance against thermal shock damage and improved erosion resistance during use. Both Darolia and Wisander et al

teach similar methods of application of the zirconia coatings (APS), and have similar applications (thermal barrier coatings for turbine engine components).

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al (US 6,764,779) in view of Wisander et al (US 4,377,371).

Liu teaches a thermal barrier coating for a turbine engine component substrate comprising alternating layers of zirconia. The layers have different amounts of stabilizer, wherein the first layer have about 6-8 wt% yttria, and the second layers have about 18-22 wt% yttria. Regarding the phases of the zirconia layers, the amounts of stabilizers added to the zirconia layers overlaps with that of the instant claims. Specifically, the first layer is preferably stabilized with about 6-8 wt% stabilizer, and the second layer is 18-22 wt%. As these ranges clearly overlap with the instant claims, the stabilization is expected to be similar, resulting in similar phases.

Liu does not specifically teach the presence of microcracks in the second zirconia layer, and does not teach the second layer or layers being thicker than the first layer or layers.

Wisander et al teach a thermal barrier coating for a turbine engine component substrate, the coating comprising second zirconia layers. Vertical microcracks are generated in the coating by scanning a laser beam over the plasma-sprayed ceramic surface (column 2, lines 11-12). These cracks provide resistance against formation and growth of catastrophic cracks during exposure to thermal shock as well as improved erosion resistance for the thermal barrier coating. It would have been obvious to one of

ordinary skill in the art at the time of the invention to provide the thermal barrier coating of Liu with microcracks like those taught by Wisander et al, as it is clearly taught that these microcracks provide the benefit of improved resistance against thermal shock damage and improved erosion resistance during use. Both Liu and Wisander et al teach similar methods of application of the zirconia coatings (APS), and have similar applications (thermal barrier coatings for turbine engine components).

Regarding the thickness of the layers, Liu teaches the application of multiple layers (up to 100 total) with each layer having a thickness of 1-50 microns. Liu does not appear to teach that each layer must be provided with the same thickness. Absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art to provide the layers of Liu with a thickness sufficient to perform the desired function of corrosion and oxidation resistance. Variation of the thickness does not appear to provide a contribution over the art of record.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASA

JENNIFER C. MCNEIL
SUPERVISORY PATENT EXAMINER
9/1/06